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Changes in contact and support exchange in personal networks after widowhood

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Abstract

The convoy model conceptualizes older adults' networks of personal relationships as convoys of social support. This prospective study examined how contact and support in several relationships changed due to widowhood. Using observations between 1992 and 2002 from the Longitudinal Aging Study Amsterdam, multilevel models describe change in contact and support of 227 widowed and 408 married older adults. Contact and support were low before widowhood and increased in all relationships after widowhood, and more so in child and sibling relationships. Around 2.5 years after widowhood, contact and support started to decrease. Our findings increase our understanding of the heterogeneity of network changes in old age and of the instability of the network as a social convoy in late life.

Widowhood, one of the most disruptive life events older adults may experience, requires more psychological and social adjustments than any other life event (Hatch, 2000). Before widowhood, older adults and their partners depend on each other for daily contact and support. After widowhood, the surviving spouse must not only deal with the emotional distress caused by partner loss but also adapt to a new role as widowed person (Utz, Carr, Nesse, & Wortman, 2002). Widowhood is a multifaceted transition (Carr & Utz, 2002), and the surviving spouse may experience psychological, financial, or social consequences, such as increased grief or depression (Stroebe, Stroebe, & Hansson, 1993), loss of income, or increased social participation (Utz et al., 2002). In addition, widowhood may have adverse consequences for the survivor's health, and in the first 6 months, a surviving spouse may be at greater risk of dying (Martikainen & Valkonen, 1996). These consequences depend on preloss characteristics and resources, may change over time, and may be intertwined.

Individuals change over time and their transitions, such as widowhood, and trajectories affect are linked with the lives of others in their personal network (Allen, Blieszner, & Roberto, 2000). In line with this life course perspective, Antonucci (2001) conceptualized older adults' networks of personal relationships as convoys of social support to emphasize the dynamic aspect of social interactions. The convoy model proposes that personal relationships may come and go, and the exchange of support increases and decreases in accordance with changing needs and changing roles. In addition, the convoy model distinguishes relationships according to their supportive function in the convoy. Close relationships fulfill attachment-related needs and role relationships act upon role requirements. The transition into widowhood is not merely a role

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change but also means the loss of an important attachment figure. Therefore, becoming widowed changes both older adults' role relationships and their close relationships.

Social resources, which consist of both networks of personal relationships and the contact and support exchanged within them, serve key functions in the adaptation to widowhood in late life (Hobfoll, 2002). In general, personal relationships and social support affect health and well-being across many domains (Allen et al., 2000). Personal relationships may have positive effects on health and well-being because contact and positive interactions with others make individuals feel better and because it strengthens individuals' perception that support is available should the need arise (Antonucci, 2001). Social contact, whether it is face-to-face or by phone, regular mail, or e-mail, may protect older adults from social isolation and loneliness (Pinquart, 2003). For bereaved older adults, face-to-face contact with significant others may be especially important because it facilitates the exchange of support and helps widowed older adults to adopt their new role (Wenger, 1990). In turn, social support may act as a buffer against the negative consequences of widowhood (Cohen & Wills, 1985).

Presently, much research defines social support as the exchange of various forms of informal assistance, such as information, practical aid, financial advice, or emotional support (Allen et al., 2000). At least two different types of support are important for (the health and well being of) widowed older adults. First, emotional support, such as talking about personal feelings and comforting each other, may relieve the emotional distress caused by widowhood. Second, instrumental support, such as help with daily chores, housekeeping, or cooking, may facilitate surviving spouses' adjustment to living on their own (Veiel, 1985).

Research in this field has not yet addressed changes in contact and support in personal networks over an extended period of time. Most research regarding personal networks after widowhood studied cross-sectional or retrospective data (e.g., Morgan, Carder, & Neal, 1997). In these cross-sectional comparisons, older adults widowed for more than 4 years reported less social contact with their family members and were less likely to report large friendship involvement than older adults widowed for a shorter period (Ferraro & Barresi, 1982; Morgan et al., 1997). Additionally, widowed older adults had more contact and exchanged more support with their personal network than married older adults. One of the few longitudinal studies with prospective data reported that social participation increased in the 6-month period after widowhood (Utz et al., 2002). Whether increased social participation will remain high over a longer period of time or eventually return to lower levels is still unclear.

This study aimed to contribute to the notion of networks as convoys in later life. The general aim was to explain how contact and support levels changed over a period of 10 years during which married older adults made the transition into widowhood. More specifically, this study described changes in contact and support older adults experienced in the different relationships of their personal networks, starting before they were widowed until some years after being widowed. Following Carr and Utz's (2002) guidelines, this study used prospective longitudinal data, contrasted the bereaved with a nonbereaved control group, and adjusted for preloss characteristics or resources, such as gender, education, and network size that affect the risk of consequences of widowhood. Moreover, we differentiated the different relationships in older adults' personal networks, that is, close and extended kin, neighbors, close friends, and acquaintances.

Hypotheses

Based on the convoy model of Antonucci (2001; Kahn & Antonucci, 1980), changes in network relationships are the result of changes in roles. The general premise in this study is that widowhood, a change from being spouse to being single, is accompanied by a change in need for contact and support. The timing of the change in need is usually considered to occur after widowhood. Yet, there is some evidence that suggests that increased needs for help before widowhood are related with increased

network support (Bowling, Farquhar, & Grundy, 1995). If, for example, one of the spouses developed a serious illness before widowhood, this may have constrained the healthy spouse to maintain his or her personal network. Utz et al. (2002) found that social participation levels decrease before the death of a spouse, primarily because of poor spousal health. When poor spousal health forced wives to become a caregiver, their social involvement with others decreased (Seltzer & Li, 2000). On the other hand, if the illness progresses, a spousal caregiver may turn to his or her network members for support, with family members, particularly daughters, being the most likely additional caregivers (Blieszner, 2006). Furthermore, evidence from Seltzer and Li's study suggests that exiting the caregiver role through bereavement is associated with increased levels of social involvement. Therefore, we would expect that, starting from an initial low point, levels of contact and support rise shortly before widowhood (Hypothesis 1).

It is well known that shortly after widowhood, widowed older adults have a high need for contact and support. Over time, the need for support and contact with others may diminish, if widowed older adults adjust to the loss of their partner. On the other hand, if widowhood becomes a chronic stressor (Bodnar & Kiecolt-Glaser, 1994), the need for support may remain high. Support and resource models suggest that if individuals draw on their support extensively over prolonged periods, they may find that their resources deplete and their support deteriorates (Li, 2005; Norris & Kaniasty, 1996). In any case, in time, network members' own everyday matters may crowd out attention for the widowed older adult. Although it is hard to give a clear set point for a normal grief period, the bereavement literature seems to agree that in general, most widowed older adults adjust to their loss after about 1–2 years (Stroebe et al., 1993). A recent study shows that in the first 2 years after partner loss, widowed older adults experienced more stress than married older adults, but after 2 years, they showed similar levels of stress as married older adults (Hagedoorn et al., 2006). Carnelley, Wortman, and Kessler (1999) showed that the adverse effects of widowhood on depression are very substantial during the first 2 years and wear off in the 3rd year after widowhood. If changes in contact and support mirror the changing needs associated with adaptation to widowhood, we would expect that contact and support rise for about 2 years and start to drop in the 3rd year after widowhood (Hypothesis 2).

Because different relationships fulfill different roles and needs, changes in contact and support and the kinds of support vary by relationship type. Seeman and Berkman (1988) showed that older adults rely on their children for instrumental and emotional support; for contact and emotional support, they rely on their close friends and relatives; and for instrumental support, they rely on their neighbors because they live nearby. The general expectation of the convoy model is that with increasing age, role loss ultimately leads to less weight of role relationships and a growing importance of family relationships in the network (Antonucci, 2001). Conversely, in the process of adjusting to widowhood, increased needs may force older adults to expand their networks (Bowling et al., 1995). Ferraro and Barresi (1982) and Field and Minkler (1988) reported stability in kin relationships among widowed older adults and increased contact and support with neighbors and friends after widowhood. Widowed older adults not only rely heavily on their children but they also tighten relationships with siblings and extended kin (Anderson, 1984). Thus, we would expect married older adults to increase contact and support in their close relationships over time (Hypothesis 3a). Because widowed older adults may have increased emotional and instrumental needs, levels of contact and support increase in a broad range of relationships. More specifically, we expect that after widowhood, levels of emotional and instrumental support increase with children, levels of contact and emotional support increase with family and friends, and levels of instrumental support increase with neighbors (Hypothesis 3b).

In sum, we tested the following two sets of hypotheses based on the above-mentioned findings. First, before widowhood, contact with and support from members in the personal

network start increasing from a low point (Hypothesis 1). This increase will continue shortly after widowhood until in the long run, contact and support returns to lower levels (Hypothesis 2). Second, people whose marriages continue show a tendency toward close relationships with close kin and close friends (Hypothesis 3a) while widows and widowers increase their contact and supportive exchanges in a broader range of relationship types (Hypothesis 3b).

Method

Participants

In 1992–1993 (T1), interviewers questioned 3,107 participants as part of the population-based Longitudinal Aging Study Amsterdam (LASA; Deeg, Van Tilburg, Smit, & De Leeuw, 2002). The sample for this program originated from the Living Arrangements and Social Networks of Older Adults program, which used a stratified random sample of men and women born between 1908 and 1937 (Knipscheer, De Jong Gierveld, Van Tilburg, & Dykstra, 1995). The oldest people, and the oldest men in particular, were overrepresented in the sample. We drew the sample from the population registers of 11 municipalities: the city of Amsterdam and two rural communities in the western region of The Netherlands, one city and two rural communities in the south, and one city and four rural communities in the east. These regions represented the differences in religion and urbanization in The Netherlands at the time (Van Tilburg & Broese van Groenou, 2002). Older adults in the west mostly have no religious denomination, in the south, they are more often Roman Catholic, and in the east, they are more often Protestant. The west is more urbanized than the south and east of The Netherlands.

In 1995–1996 (T2; $N = 2{,}545$), 1998–1999 (T3; $N = 2{,}076$), and 2001–2002 (T4; $N = 1{,}691$), LASA performed follow-ups. After T1, 1,051 (34%) participants died, 222 (7%) participants refused cooperation, and 143 (5%) participants were ineligible or not contacted. The LASA interview covered a wide range of topics related to physical and cognitive health, and social and psychological functioning. In each wave, the interviewers received 4 days of training and the LASA fieldwork manager supervised them intensively. The interviewers tape-recorded their interviews to monitor and enhance the quality of the data obtained. The interviews took between 1.5 and 2 hr.

For our study, we selected participants with at least one follow-up observation ($N = 2{,}545$) who were married at T1 ($N = 1{,}633$). A total of 357 (22%) of these participants were widowed at one of the follow-up observations (155 between T1 and T2; 113 between T2 and T3; and 89 between T3 and T4). We excluded participants when data regarding their personal network lacked. In all the observation cycles, there were various reasons not to delineate the networks for all the participants. Most frequently, participants were too physically or cognitively frail to be interviewed with the full questionnaire. Instead, interviewers conducted a brief interview by telephone with the participant ($n = 105$), or with a proxy for the participant ($n = 57$), or an abridged version of the face-to-face interview ($n = 70$). These short interviews did not include the network delineation. Furthermore, data on the personal network were not available for 9 participants due to the premature termination of the interview or refusal for privacy reasons. Finally, we excluded participants who did not live together with their spouse (21) or were institutionalized (35), as well as 8 widowers and widows who started a new partner relationship or remarried. Excluded participants were less healthy and older than included participants. In this way, data from 1,100 (86%) still-married participants and 228 (64%) widows and widowers were available for our analyses.

In the Dutch population, widowed older adults constituted on average 24% of older adults over 55 who were married and community dwelling between 1995 and 2002 (Statistics Netherlands, 2005). As compared to the Dutch population, this sample contains a smaller percentage of widowed participants (17% of 1328). In contrast to the population numbers, which do not differentiate older adults who were already widowed and who became widowed during that period, this

percentage solely exists of older adults who became widowed in the past 10 years.

As in most western countries, in The Netherlands, more women than men over 65 are widowed. About 80% of the older men live with a partner and slightly less than half of the older women live with a partner (Netherlands Interdisciplinary Demographic Institute, 2003). After partner loss, older adults are unlikely to remarry due to their age (Fokkema, 2001). In line with what Dutch older adults prefer, Dutch policy stipulates that older adults remain community dwelling as long as possible. Mental health care settings offer programs that stimulate peer contacts among widows and widowers as a way to prevent depression (Cuijpers, Bohlmeijer, Beekman, & Smit, 2003).

Widowed participants were less often male and older than participants whose marriage continued, 29% versus 63% male, $\chi^2(1) = 90.5$, $p < 0.001$; M (age) = 70.0 versus 66.2, $t(1326) = 7.0$, $p < .001$. Matching each widowed participant with a maximum of 2 married participants enhanced comparability. The matched sample consisted of the 227 widowed participants and 408 married participants. We considered a match as successful only if a participant's observations were available at a minimum of two consecutive waves, if these observations took place at the same waves as the widowed participant's observations, if participants were married during all observations, if they had the same gender as the widowed participant, and if their absolute age difference with the widowed participant was not more than 5 years. A first match was available for all widowed participants, a second match failed particularly among the oldest participants. There were no gender or age differences between the widowed participants and the selected 408 participants whose marriage continued (Table 1). On average, 3.6 observations, of which 1.9 after widowhood, were available for widowers and widows, and 3.4 observations for the married participants.

Measurements

To obtain adequate information on older adults' personal networks, we asked older adults to identify their relationships by name. To ensure that all types of relationships had the same chance to be recorded, we took care that participants identified their networks with a domain-specific approach (Van Tilburg, 1995) using seven formal types of relationships: household members (including the spouse), children (including stepchildren) and their partners, other relatives, neighbors, colleagues (including voluntary work or school), fellow members of organizations (e.g., athletic clubs, church, political parties), and others (e.g., friends and acquaintances). To ensure that participants identified socially active relationships, but not individuals whom they saw frequently without planning to do so (such as the members of a club), we added the importance of the relationship as a criterion. In each of the seven domains, the interviewers asked the participants to "name the people (e.g., in your neighborhood) you have frequent contact with and who are also important to you." The interview allowed participants to identify only persons above the age of 18 and to identify a maximum of 80 persons. No participant reached this limit. The design of the measurements for the four observations was the same, giving network members identified in a previous observation and others the same chance to be identified in later observations. We excluded the spouse for two reasons. First, the spouse is not a network member after widowhood. Second, there was very little variation in support across spousal relationships.

We distinguished eight categories of relationship type: children, children-in-law, siblings, siblings-in-law, other kin, friends, neighbors, and other types of relationship. For all identified relationships, the interview gathered information on the network member's gender and contact frequency with the participant. The contact frequency was asked with a single question, "How often are you in touch with X?"; with answer values that corresponded with the number of days a year: *never* (0), *once a year or less* (1), *a few times a year* (6), *monthly* (12), *every fortnight* (26), *weekly* (52), *a few times a week* (156), and *daily* (365). Additionally, participants reported on the support they exchanged with each of the nine network members with whom

they had the highest contact frequency. If participants identified fewer than nine network members, they reported on the support of all their network members.

One question for each selected network member asked participants about receiving instrumental support: "How often in the past year did X help you with daily chores in and around the house, such as preparing meals, cleaning the house, transportation, minor repairs, filling out forms?" One question asked participants about receiving emotional support: "How often in the past year did you talk to X about your personal experiences and feelings?" For support given, the questions were reversed. The answer categories were *never* (0), *seldom* (1), *sometimes* (2), and *often* (3). Thus, at the dyad level, participants reported on the contact frequency with each of their network members and on their support exchange with their most frequently contacted network members.

Analysis plan

These data can be viewed as hierarchical or multilevel data because longitudinal observations or repeated measurements are nested within individuals (Hox, 2002). Moreover, because observations of dyads are clustered within a given longitudinal observation of a given participant, the data have a hierarchical structure consisting of three levels: participant, longitudinal observation, and dyadic observation. Hierarchical linear modeling or multilevel regression modeling, which is designed to deal with such dependency (Snijders & Bosker, 1999), uses a maximum likelihood procedure to estimate parameters that describe the longitudinal relationship between the five response variables contact frequency, emotional support received and given, and instrumental support received and given, and the explanatory variables. One important advantage of multilevel modeling is that it can handle unbalanced data structures, such as where some participants may have two and others may have three or more observations.

We applied the forward modeling approach starting with an empty model (containing only a constant) and adding parameters (explanatory variables and interactions of variables) in subsequent steps. The -2 log likelihood (deviance; i.e., the lack of fit between the model and the data) characterizes each model. The difference between the deviances of the steps is χ^2 distributed with the number of added parameters as degrees of freedom. A significant χ^2 value indicates whether adding parameters improved fit between the model and the data.

The first analysis used observations of widowed participants only and determined how the effect of widowhood changes over time. For this analysis, 227 participants with valid observations were available. To show how before and after widowhood changes in contact and support differ, we defined widowhood as a breakpoint. Then, we computed a set of quadratic spline functions (Schumaker, 1981), which are functions that join smoothly at the breakpoint, widowhood. We modeled the following set of equations for all response variables, $f_1(t) = (t_x - t_w)$ for linear change, $f_2(t) = (t_x - t_w)^2$; if $t_x \leq t_w$, 0 otherwise for quadratic change before widowhood; and $f_3(t) = (t_x - t_w)^2$, if $t_x > t_w$, 0 otherwise for quadratic change after widowhood, where t_x is the moment of observation and t_w is the moment of widowhood. Thus, in addition to simple linear change around widowhood, we modeled the quadratic change before and after widowhood separately.

In contrast to the first analysis, the second analysis compared married observations of all participants with the first observation after widowhood of the widowed participants. In this way, the analysis differentiated linear changes among widowed participants from changes among married participants. To ensure that married participants would remain married at a follow-up observation, we removed every last observation of a married participant from this analysis. For this analysis, 634 participants with valid observations were available. In Model 1, a dummy variable indicated whether a participant belonged to the married group or to the widowed group, another dummy variable indicated whether participant was married or widowed at the moment of observation, and the variable time indicated the years passed since T1. Extending

Model 1, Model 2 determined how different types of relationships developed over time and after widowhood. Therefore, we first added to the model seven dummies for the type of relationship (with the category of "other relationships" as the category of reference). Model 2a determined specific relationship changes over time with interaction effects of the relationship type dummies and time; Model 2b determined specific relationship changes after widowhood with interactions of relationship type and widowhood. Finally, Model 3 adjusted for preloss characteristics, namely, the participant's age, gender, and education; the network size and the network member's gender; and contact frequency. In the support models, we adjusted for the frequency of contact older adults had with their network members. Because the estimate was very small, we multiplied the contact frequency by 100. Thus, the parameter estimate for the network member's contact frequency shows how much support levels change for every increase of 100 days in the contact between older adults and one of their network members. All models were fixed-effect models.

Results

Differences between married and widowed participants

Table 1 shows that at T1 widowed and married participants were rather similar, which was to be expected, as at T1, all participants were still married. At T1, the only statistically significant difference adjusted for age, gender, and education: Married participants gave an average network member more instrumental support than widowed participants did. Table 1 further shows what the networks of these older adults look like at T1. Among married and widowed older adults, children and children-in-law constitute the major part of their networks followed by neighbors and friends. Table 1 also shows that over time, differences developed between married and widowed participants. Although married and widowed participants had similar sized networks at each observation, within these networks, they exchanged different amounts of support and contact. Widowed respondents received significantly more emotional support after they were widowed whereas married respondents' levels of emotional support did not change over time. A similar pattern of differences existed for the contact frequency. After widowhood, widowed participants gave a typical network member more emotional support than married participants did at their first observation. Thus, during the stressful period after widowhood, widowed participants exchanged more emotional support with a typical network member than married participants did. Before widowhood, widowed participants received more instrumental support than married participants at their first observation. Widowed older adults already receiving more instrumental support from their network members could mean that they or their partner need support because of their caregiving or health, respectively. While widowed participants received more instrumental support from a typical network member, they gave less after they were widowed than before they were widowed. Likewise, married older adults received more instrumental support but gave less at their final observation than at their first observation. These instrumental support differences could be related to health differences.

Changes in contact and support before and after widowhood

To test our first and second hypotheses that before widowhood contact and support start to increase from a low point, continuing shortly after widowhood, until in the long run, contact and support return to lower levels, we used quadratic spline functions (Table 2). We fitted these models on the observations of widowed participants only. Emotional support, which older adults gave to their network members showed no significant effects over time. Quadratic splines were statistically significant for frequency of contact, emotional support received, and instrumental support received and given. Observations ranged from as early as 9 years before until 9 years after widowhood and were normally distributed around widowhood ($M = 0.3$, $SD = 4.0$). The first observation after widowhood varied

Table 1. *Means and standard deviations of key variables compared between married and widowed older adults and T1 and over time*

	Baseline comparison					Longitudinal comparison								
						Married				Widowed				
	Married[a]		Widowed[b]			First		Final		Before		After		
Variables	*M*	*SD*	*M*	*SD*	*F*(1, 634)	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*(3, 1221)
Emotional support														
Received	2.81	0.71	2.81	0.68	0.04	2.81	0.71	2.71	0.75	2.72	0.73	2.93	0.76	5.50**
Given	2.66	0.76	2.67	0.73	0.13	2.66	0.76	2.78	0.69	2.72	0.72	2.81	0.73	3.19*
Instrumental support														
Received	1.66	0.68	1.76	0.67	3.30	1.66	0.68	1.80	0.70	1.84	0.70	2.07	0.71	17.18***
Given	1.77	0.73	1.58	0.65	6.35**	1.77	0.73	1.62	0.65	1.56	0.65	1.47	0.58	8.70***
Contact frequency	83.35	52.88	90.52	57.41	3.24	83.35	52.88	76.03	50.64	85.61	55.98	93.60	53.97	5.77***
Network size	14.49	8.07	13.98	8.27	0.38	14.47	8.06	14.56	7.94	14.19	8.80	15.29	8.85	0.83
Children	2.22	1.34	2.25	1.47	0.25									
Children-in-law	1.26	1.13	1.25	1.13	0.05									
Siblings	0.65	0.95	0.65	0.81	0.05									
Siblings-in-law	0.54	0.85	0.54	0.87	0.02									
Other kin	0.25	0.60	0.21	0.65	0.83									
Friends	0.97	1.36	0.95	1.44	0.00									
Neighbors	1.33	1.55	1.41	1.63	0.46									
Other	0.93	1.41	0.81	1.23	0.65									
Age[c]	68.85	7.32	69.96	7.57										
Education[d]	8.69	2.94	8.50	3.15										
Sex (% men)[e]	0.32	0.47	0.29	0.45										

Note. *F* tests were adjusted for age, gender, and education.
[a] $n = 408$.
[b] $n = 227$.
[c] $t(634) = 1.82$.
[d] $t(634) = -0.76$.
[e] $\chi^2(1) = 0.7, p > .05$.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 2. *Parameter estimates of change over time in contact and support exchange after widowhood*

			Emotional support				Instrumental support			
	Frequency of contact		Received		Given		Received		Given	
Variables	*B*	*t*	*B*	*t*	*B*	*t*	*B*	*t*	*B*	*t*
Intercept	40.85	3.6***	0.72	3.9***	0.59	3.5***	0.67	3.8***	0.76	4.6***
Sex (female)	−5.05	−2.1*	0.03	0.8	0.04	1.2	−0.07	−1.9	−0.09	−2.9**
Age at T1	0.04	0.3	0.00	−1.6	0.00	−0.7	0.00	−1.1	−0.01	−3.2**
Education (years of)	−1.16	−3.7***	0.01	2.1*	0.02	4.0***	0.00	0.9	0.01	1.7
Baseline contact or support	0.59	29.5***	0.81	28.2***	0.77	30.2***	0.81	27.5***	0.76	29.6***
$f1$[a]	1.94	2.4*	0.06	4.0***	0.02	1.9	0.07	4.7***	−0.03	−2.3*
$f2$[b]	0.35	2.2*	0.01	2.0*	0.00	0.8	0.01	1.7	0.00	−0.5
$f3$[c]	−0.32	−2.2*	−0.01	−3.6***	0.00	−1.1	−0.01	−4.4***	0.00	2.0*
N observations	12,290		6,693		6,693		6,693		6,693	

Note. *N* participants = 227.
[a]$f1$ = moment of observation (t_x)−moment of widowhood (t_w).
[b]$f2 = (t_x - t_w)^2$, if $t_x \leq t_w$.
[c]$f3 = (t_x - t_w)^2$, if $t_x > t_w$.
*$p < .05$. **$p < .01$. ***$p < .001$.

from as early as 33 days to 3.5 years after the event ($M = 1.4$, $SD = 0.9$).

Figures 1 and 2 show the estimated average change in contact and support from 4 years (-1 *SD*) before widowhood until 4 years after widowhood ($+1$ *SD*). These average trajectories showed that 2.8 years before widowhood, contact and 4 years before widowhood, emotional support were at a low point. Around the time of widowhood, contact and support levels were increasing. Around 2.5 years after widowhood, contact and support reached their highest point, after which they started to decrease again.

The instrumental support older adults received from their network members showed a similar pattern as emotional support received, and the instrumental support older adults gave to their network members showed an inverse pattern. Before widowhood, older adults decreased their instrumental support given to their network members. At 2.6 years after widowhood, this support reached the lowest point after which it started to increase again. The lowest point for instrumental support received and the highest point for instrumental support given could not be ascertained as the quadratic development of instrumental support before widowhood was not significant (see parameter estimates for function *f*2 in Table 2).

As expected, before widowhood, older adults' contact and support were in a trough, while around the time of their widowhood, contact and support from their network members increased. After about 2.5 years, contact and support levels started to decrease.

Figure 1. Average change in frequency of contact with a given network member from 4 years before until 4 years after widowhood.

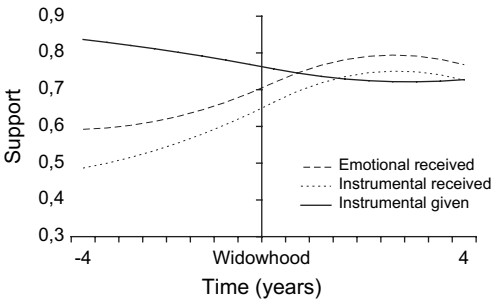

Figure 2. Average change in support exchange with a given network member from 4 years before until 4 years after widowhood.

Changes in contact and support related to widowhood

Next, we analyzed three models that compared observations of all participants while they were married, with the first observation after widowhood. In Model 1, we determined whether the short-term increase was specifically related to widowhood. Model 2 determined the amount of contact and support exchanged in specific types of relationships, and Model 3 controlled for the participant's gender, age, education, and network size and the network member's gender. Table 3 reports the parameter estimates of Model 1 and Model 3, and Table 4 reports the improvement in fit from the empty model to the final model.

As can be read from Table 4, adding two dummies for widowhood and one parameter for time significantly improved the empty model for all response variables. As the parameter estimates of Model 1 show, the widowed older adults as a group did not differ from married older adults, except for the instrumental support they exchanged with their network members. Furthermore, after widowhood, older adults indeed experienced changes in contact and support exchange that married older adults did not (Table 3). After widowhood, widowed older adults had 12.6 days a year more contact with their personal network members than married older adults. As hypothesized, after widowhood, widowed older adults received more emotional support. As a group, widowed older adults received more instrumental support from their network

Table 3. *Parameter estimates of predictors of contact and support exchange in Model 1 and Model 3*

			Emotional support				Instrumental support			
	Frequency of contact		Received		Given		Received		Given	
Variables	*B*	*t*	*B*	*t*	*B*	*t*	*B*	*t*	*B*	*t*
Model 1										
Constant	79.13	35.9***	2.77	86.8***	2.68	86.4***	1.68	55.7***	1.77	59.1***
Dummy 1 (1 = widowed group)	3.93	1.1	−0.02	−0.4	0.02	0.5	0.11	2.4*	−0.16	−3.2**
Dummy 2 (1 = widowed observation)	12.63	4.3***	0.24	4.6***	0.03	0.7	0.21	4.4***	−0.06	−1.2
Time (years)	−0.99	−2.8**	−0.01	−2.2*	0.01	3.3***	0.01	3.2**	−0.02	−4.3***
Model 3										
Constant	155.00	8.8***	2.38	9.1***	2.66	10.5***	0.88	3.6***	3.54	15.4***
Dummy 1 (1 = widowed group)	2.82	0.9	−0.03	−0.7	0.02	0.4	0.09	2.0*	−0.14	−3.1**
Dummy 2 (1 = widowed observation)	11.52	4.3***	0.27	5.3***	0.07	1.4	0.25	5.1***	0.00	0.1
Time (years)	−1.04	−3.2**	−0.01	−2.2***	0.01	3.2**	0.02	3.7***	−0.02	−4.9***
Relationship types[a]										
Child	81.17	43.1***	0.68	31.6***	0.66	29.1***	0.82	37.3***	0.74	33.8***
Child-in-law	37.33	18.2***	0.34	14.3***	0.28	11.1***	0.63	25.6***	0.54	22.1***
Sibling	−5.81	−2.7**	0.31	11.2***	0.35	12.2***	0.00	−0.1	0.16	5.7***
Sibling-in-law	−13.82	−6.7***	0.10	3.3**	0.15	5.0***	−0.07	−2.2*	0.09	3.1**
Other kin	−6.47	−2.9**	0.03	0.8	0.11	2.6**	0.10	2.6*	0.57	14.6***
Neighbor	−3.83	−1.8	0.36	13.8***	0.40	14.6***	0.10	3.7***	0.10	3.6***
Friend	92.32	45.2***	−0.18	−7.7***	−0.14	−5.6***	0.20	8.4***	0.17	7.2***
Control variable										
Sex (1 = female)	−8.30	−2.3*	0.16	3.2**	0.09	1.9	−0.15	−3.2**	−0.29	−6.5***
Age at T1	−1.07	−4.8***	−0.01	−1.7	−0.01	−3.2**	0.01	1.8	−0.03	−12.3***
Education (years)	−2.24	−4.4***	0.02	3.3**	0.02	3.5***	−0.01	−1.1	0.02	2.8**
Sex of network member (1 = female)	−8.86	−8.4***	0.28	23.4***	0.32	25.7***	−0.01	−0.8	0.06	5.1***
Network size	−0.70	−3.8***	0.01	4.5***	0.01	4.9***	0.01	3.3***	0.01	2.9**
Frequency of contact (days × 100)			0.08	2.5*	0.05	1.8	0.11	3.5***	0.16	5.5***
N observations	24,387		16,468		16,468		16,468		16,468	

Note. *N* participants = 634.

[a] Other type of relationship is the category of reference.

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 4. *Model improvement for three models on contact and support exchange*

	Frequency of contact		Emotional support				Instrumental support			
			Received		Given		Received		Given	
Model	χ^2	*df*	χ^2	*df*	χ^2	*df*	χ^2	*df*	χ^2	*df*
1. Widowhood and time	26.0	3***	24.1	3***	15.5	3**	61.3	3***	40.1	3***
2. Relationship types	5286.0	8***	2127.4	8***	1688.9	8***	2777.1	8***	1873.3	8***
2a. Interaction of relationship and time	11.0	9	18.0	9	54.1	9***	19.6	9*	23.3	9**
2b. Interaction of relationship and widowhood	28.0	9***	13.1	9	26.6	9**	51.5	9***	22.2	9**
3. Relationship types with control variables	126.0	6***	602.1	6***	719.6	6***	36.4	6***	212.8	6***

*$p < .05$. **$p < .01$. ***$p < .001$.

members than married older adults and they received even more instrumental support afterthey were widowed. Additionally, widowed older adults gave less instrumental support to their network members than married older adults, but after widowhood they did not decrease their instrumental support significantly.

Relation-specific changes in contact and support among married participants

To test the first part of our third hypothesis, that participants whose marriage continued would show a tendency toward close relationships, we added to the widowhood model (Model 1) dummies for the type of relationship (Model 2) and added interaction effects of time and dummies for type of relationship (Model 2a). Adding parameters for type of relationship led to a significant model improvement for all response variables, adding interaction effects only for frequency of contact and for emotional and instrumental support given (Table 4). Dummies for type of relationship indicate the amount of contact and support exchanged in a certain type of relationship compared to the reference category of other relationships. In Model 3, the parameter estimates for type of relationship show that older adults had the highest contact frequency with their friends and children, and they had the highest exchange of support with their children (Table 3). The interaction effects in Model 2a indicate whether participants changed their contact and support exchange in a given type of relationship at a different rate than in other types of relationships and demonstrate whether a tendency toward close relationships existed. The few, statistically significant interaction effects of type of relationship and time provide minor support for a tendency toward close relationships among married older adults (not shown). In a broad range of relationships, the response variables changed similarly over time, nevertheless, over time, married older adults moved away from some of the less close relationships and toward some of the close relationships. They received increasingly less emotional support from their siblings-in-law and neighbors

($B = -0.03$, $p < .05$; $B = -0.03$, $p < .05$) and provided their extended kin with increasingly less instrumental support ($B = -0.04$, $p < .01$). Moreover, married older adults moved toward close relationships that provided instrumental support. They received increasingly larger amounts of instrumental support from their children and children-in-law ($B = 0.05$, $p < .01$; $B = 0.03$, $p < .05$). Inconsistent with our expectations, married older adults also received increasingly larger amounts of instrumental support from their neighbors ($B = 0.03$, $p < .05$).

Relation-specific changes in contact and support among widowed participants

To test the second part of our third hypothesis that widows and widowers increase contact and supportive exchanges in a broad range of relationship types, we removed the interaction effects of time and type of relationship and fitted interaction effects of widowhood and dummies for the type of relationship (Model 2b). Only a few interaction effects were statistically significant. These led to a significantly improved model for all response variables except emotional support received (Table 4). In a broad range of relationships, the reaction to widowhood was similar: Contact frequency between widowed older adults and their network members increased and emotional support received from network members increased. Still, three types of relationship reacted differently to widowhood. As expected, after widowhood, emotional and instrumental support parents received from their children increased more than from other relationships ($B = 0.03$, $p < .01$; $B = 0.05$, $p < .001$), while the instrumental support parents provided to their children decreased more than in other relationships ($B = -0.03$, $p < .01$). Participants also received increasingly larger amounts of instrumental support from their children-in-law ($B = 0.03, p < .01$). In addition, after widowhood, contact frequency between older adults and their children increased ($B = 11.5$, $p < .05$). Furthermore, contact among widowed older adults and their friends increased more than in other types of relationships ($B = 14.5$, $p < .05$), confirming that widowed older adults turned to their friends and relatives for contact. The amount of emotional support participants provided to their siblings increased more than in other relationships ($B = 0.03$, $p < .01$).

Preloss and network member characteristics

Finally, we adjusted for the following preloss characteristics: participants' gender, age, education, network size, and network members' gender. This improved the model (Table 4) but did not alter the previous effects. These characteristics show that men had more contact and exchanged more instrumental support with their network members, while women exchanged more emotional support with their network members. Older adults had less contact but exchanged more emotional support with their female network members than with their male network members. Furthermore, older adults with higher education engaged in less contact but exchanged more support than lower educated older adults. Contact and support for network members decreased with increasing age. The larger the network, the less contact participants had with individual network members and the more support they exchanged with their network members. The more frequent older adults and their network members contacted each other, the more support they exchanged. Men and women may change their contact and support differently after widowhood; therefore, we tested for interaction effects of gender and widowhood. We found none; thus, men and women showed similar changes after widowhood in this sample.

Discussion

We studied the changes in frequency of contact as well as support that older adults experience in a broad range of personal relationships during the transition into widowhood. We tested four hypotheses and our results lead us to conclude the following. First, shortly before being widowed, contact with and support from members in the personal network start to increase and continue shortly after widowhood. Second, contact and support

return to preloss levels in the long run. Third, people whose marriages continue tend to focus on close relationships such as kin and close friends. Fourth, widows and widowers continue their contact and supportive exchanges in a broader range of relationship types. We discuss these conclusions in the following paragraphs.

First, we examined widowhood-related changes in personal networks over time. This study showed that while contact and support were at a low point before widowhood, older adults already experienced increases in contact and emotional support received from their network members. These increases continued after widowhood. In the 3rd year after widowhood, these increases leveled off and started to decrease toward preloss levels. This confirms that changes in personal relationships are associated with changes in roles that supposedly lead to changes in needs for support. Despite the fact that needs are not measured directly in our study (nor in many other studies on personal relationships), changing needs seem to be the crucial underlying mechanism under changes in relationships. Widows and widowers turn to their network of personal relationships for emotional and instrumental support to cope with widowhood (Utz et al., 2002; Wenger, 1990). Our study adds that older adults already do this before they are widowed. In this way, older adults' personal networks function as a convoy of support (Antonucci, 2001). Before older adults lose their partner, their support networks are attentive to their changing needs and they continue doing so during the transition into widowhood.

Furthermore, these changes also show that older adults cannot rely on their personal relationships indefinitely, as in the 3rd year after widowhood, contact and support start to decrease, which could mean that older adults adapted to widowhood or that network members returned to their own daily routines. Unfortunately, we cannot be certain whether older adults successfully adjusted to widowhood (reducing the need for support) or whether support deteriorated because network members withdrew their support for other reasons. Bonanno, Wortman, and Nesse (2004) showed that widowed older adults follow different trajectories in their well-being. Mostly, widowed older adults either returned to previous levels of well-being or did not show change in their well-being over time. Other widowed older adults suffered lower levels of well-being over prolonged periods. Therefore, we suspect that many older adults adjusted successfully over time with the support from their network members. Nevertheless, some widowed older adults fail to adjust to widowhood; they may experience a depletion of their resources in the end. This would imply that after around 3 years, older adults who fail to adjust to widowhood might benefit from interventions that reinforce their supportive networks (e.g., Stevens, Martina, & Westerhof, 2006).

Because older adults not only received more emotional support from their network members but they also provided their network members with more emotional support, it seems that upon widowhood, both the widowed older adults and their network members need emotional support from each other. Widowhood is not merely a loss for the spouse; network members have also lost someone (a parent, a friend, a neighbor). Still, changes in instrumental support show that widowed older adults are the focal person. While instrumental support widowed older adults received from their network members increased, instrumental support they provided to their network members dropped. Having to reorganize their household may hamper older adults to provide instrumental support to others. While support with practical matters from others may facilitate adjustment, as it compensates for daily support from their spouse and it may ease the reorganization of the household.

Second, we showed that changes in contact and support were specifically related to widowhood. As a group, widowed older adults exchanged similar amounts of contact and support as married older adults. After widowhood, widowed older adults experienced changes in contact and support that married older adults did not. In late life, changes in contact and support with network members show considerable heterogeneity (Van Tilburg, 1998). Because the effect is only temporary, widowhood is an event that adds to this heterogeneity—widowed

older adults increase contact and support with network members more than married older adults. Because increased contact and support seem to be aimed at helping widowed older adults adjust to their new situation, an interesting question would be whether these changes actually facilitate adjustment. Will older adults remain healthier, or feel better, if their support increases? Can these increases in support and contact protect older adults from the adverse consequences of widowhood?

Third, as expected, older adults who remained married changed their personal network in favor of close kin and close friends in the process of aging. At baseline, older adults exchange more contact and support with network members of the closer relationship types such as friends, children, and children-in-law. Over time, the relationships among older adults and their children seem to strengthen as they receive increasingly larger amounts of instrumental support from their children. Extended kin relationships and neighbors, not considered to be "close" relationships, decrease in contact frequency and support faster than other relationships. These findings hint at a tendency to focus on close relationships rather than a broader range of relationships (Carstensen, Isaacowitz, & Charles, 1999). On the other hand, our fourth hypothesis was that widowed adults would increase their contact and supportive exchanges over a broad range of relationships. As expected, after widowhood older adults increase their contact and support with all types of network members. These findings go a step further than the findings of Ferraro and Barresi (1982) and Field and Minkler (1988) by further differentiating the term "stability in kin relationships." Not only do contact and support from children increase more than in other relationships, widowed parents also decrease instrumental support given to their children faster than to other network members. In addition, after widowhood, older adults provide their siblings with more emotional support. Moreover, these findings show that although intergenerational and family ties are a major source of support, friends are a major source of contact. The fact that contact and the different types of support change differently in the various relationships of the network confirms that these relationships fulfill different roles (Antonucci, 2001). Because widowed older adults needs may change over time, assessing a widowed older adult's needs may improve intervention by aiming them at the specific relationships that fulfill these needs.

We should mention several limitations of the study. First, because this study is based on a Dutch survey, the results reported may be limited to Dutch older adults and widowhood-related changes in contact and support may be different outside The Netherlands. In their cross-sectional comparison of older adults' social networks in four nations, Antonucci et al. (2001) reported that illness and widowhood was a common experience for older adults in France, Germany, Japan, and the United States, but that these experiences affected the networks of older adults in these nations differently. In the United States, widowhood and illness had less impact on the social networks of older adults than in France, Germany, or Japan. This suggests that role expectations of being widowed, such as what widowed older adults expect from their network members and how older adults respond to them, vary in different nations. To what extent the results reported here apply to older adults in other countries is a question for future research.

Second, the study may have overestimated support in certain types of relationships among older adults with large networks. Because we included only the nine network members, or fewer if participants identified fewer network members, with whom participants had the most contact, we may have missed support data about less supportive network members for participants with more than nine network members.

Third, due to the matching procedure, married and widowed respondents were similarly distributed across gender and 5-year age span. This made respondents more readily comparable. Thus, the results optimally describe changes in networks of widowed older adults as compared with the married older adults. Unfortunately, we could not take into account effects of recently widowed older adults' increased mortality. The results may therefore

be limited to widowed older adults who survived recent widowhood. In addition, respondents still could have been different in many unobserved ways, like on the characteristics of their spouses. It might be possible to explain more of the interindividual variability, if we could take these unobserved differences into account. One might expect, for example, that a survivor of a much loved spouse may experience a stronger increase in contact and support than a survivor of a less loved spouse. Both surviving individuals still experience a change in the same direction for both contact and support increases. Therefore, we do not think this would have affected our conclusions.

Although widowhood is a drastic life event, it is not only a period of loss. Like the widowed older adults who adapt to their new role and seek compensation for lost partner contact and support, network members also respond to widowhood and some of them more than others. Levels of contact and support with network members may be low before widowhood; on average, they start to increase before older adults lose their spouse. Moreover, these changes are independent of older adults' personal characteristics or resources. After widowhood, these rising levels of contact and support from network members may make older adults' adjustment to widowhood easier. Still, contact and support do not increase indefinitely; for most older adults, contact and support drop in the 3rd year after widowhood. Furthermore, even though older adults change their contact and support levels in favor of their close relationships, after widowhood, they rely on a broader range of relationships. Even so, their children are their major source of support. In this way, widowhood is an event that adds to the heterogeneity of network changes in old age.

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